

REMARKS / ARGUMENTS

Prior to a first Office Action in the above-identified continuation application, Applicants have amended paragraph numbers [0013], [0048] and [0059] of the specification to correct minor spelling errors therein. Paragraph [0053] has been amended to correct errors in description of the method of forming the bottom lining. It is respectfully submitted that the amendments conform to the teachings of the specification, and no new matter has been added.

Substantively, Applicants hereby submit an Affidavit of Roger Poeta, Sales Representative of North American Refractories Co., and an Affidavit of Charles William Patterson, II, a former salesman of North American Refractories Co., and now a contract professional for North American Refractories Co. to support a finding that the claimed invention is not obvious in view of the cited references. In this respect, the claims currently stand rejected under 35 U.S.C. Section 103(a) as being unpatentable over U.K. Patent Application No. 2164281 to Porter et al. in view of U.S. Patent No. 4,177,855 to Duchateau et al. or U.S. Patent No. 5,704,184 to Malloy. It is the Examiner's position that the claimed invention would be obvious in view of these references. Applicants respectfully disagree. To the best of Applicant's knowledge, a structure as set forth in the claims was not known prior to the present application.

Applicants respectfully submit that forming a refractory component comprised of an impact pad formed of a plurality of closed packed bricks and embedding such impact pad is not obvious in view of the references cited by the Examiner. In this respect, conventional wisdom, prior to Applicants' invention, not only felt that Applicants' component was a step backwards in the art, but also felt that the resultant component itself was not feasible. Originally, the industry resisted its use in lining refractory vessels. It is respectfully submitted that the foregoing criteria indicates that the claimed invention would not have been obvious to one skilled in the art, those skilled in the art believing that such a component was not feasible and was a step backwards in the art. '[P]roceeding contrary to the accepted wisdom . . . is "strong evidence of unobviousness."' *In re Hedges*, 783 f.2d 1038, 1041, 228 USPQ 685, 687 (Fed. Cir. 1986) (citing *W.L. Gore & Assoc., Inc. v. Garlock, Inc.*, 721 F.2d 1540, 1552, 220 USPQ 303, 312 (Fed. Cir. 1983)). The

attached Affidavits show that the claimed structure was first met with skepticism, and was contrary to conventional wisdom.

By way of background, ladle bottoms were historically constructed of bricks that were individually laid within the ladle by skilled bricklayers. One embodiment of this past practice is described in U.S. Patent No. 5,704,184 (cited by the Examiner), in which thicker bricks are placed in a specific area to define an impact pad. One problem associated with laying an all-brick ladle bottom is keeping the bricks forming the lining (and impact pad portion thereof) in compression. Maintaining the bricks in tight compression is necessary to prevent molten metal from penetrating the refractory brick lining and contacting the metal shell of the ladle. A loose brick may also cause a situation referred to in the industry as "float-out," where one or more bricks dislodge from the refractory lining thereby exposing the metal shell of the ladle to the molten metal. This condition typically leads to the catastrophic failure of the ladle shell, a situation referred to in the industry as "break-out."

Past practice when laying all-brick bottoms was to keep the brick in compression by driving wedges or ramming a refractory material into the space between the brick and the metal shell or backup lining of the ladle. This practice was relatively efficient because the space between the outermost bricks and the sidewall of the ladle was not large, and this space would be covered and protected by the bricks forming the refractory lining along the side wall of the ladle, as can be seen in FIG. 1 of the present invention.

Later, ladle bottoms were constructed using castable refractory materials. Cast ladle bottoms offer certain advantages over the practice of laying brick shapes in the bottom of ladles. For example, as indicated above, laying bricks in ladle bottoms is a time consuming process that requires skilled labor to insure proper installation. In addition, improved ladle bottom life has been realized due to recent developments in castable materials with high resistance to impact and erosion. Because of the cost savings and improvements in castable materials, there has been a move away from bricked ladle bottoms to cast bottoms.

The use of castable materials in ladle bottoms evolved in several steps. At first, castable materials were used to form "cast impact pads" that were prepared outside the ladle and then placed inside. Bricks were then layed around the cast impact pads thereby completing the lining of the bottom of the ladle. Over time, the advantages in costs and the improved performance of castable materials lead to the entire bottoms of ladles being lined with cast materials. Thus, prior to the present invention, the state of the art was to line the bottom of ladles with a castable refractory material.

However, improvements in the technology and performance of refractory bricks in recent years has resulted in products that have the potential to provide better performance than the castable materials that had come into widespread use in ladle bottoms.

It was in this setting that Applicants developed the present invention. The present invention provides a component that utilizes the improved performance of refractory brick in combination with the convenience of castable materials. It should be pointed out that Applicants' invention originally met with skepticism by the industry. In this respect, the industry had great concerns about the ability of the component to maintain the refractory brick within the lining during use. Namely, the industry had great concerns regarding bricks "floating out" of the pad, thereby creating the aforementioned catastrophic "break-out" situation. Only after assuming responsibility for any consequences resulting from test runs, were Applicants allowed to test the present invention. Only when shown that refractory bricks forming the impact pad would not "float out" from the cast slab, did industry appreciate and embrace the advantages of the present invention, i.e., the use of superior refractory brick, together with castable material. Heretofore, a component comprised of an impact pad formed of a plurality of refractory bricks embedded within a castable material was not known.

Applicants respectfully submit that the present invention is novel and not obvious in view of the references cited by the Examiner.

As indicated in the attached Affidavits, the Applicants were not aware of the claimed structure prior to the development by North American Refractories Co. When North American

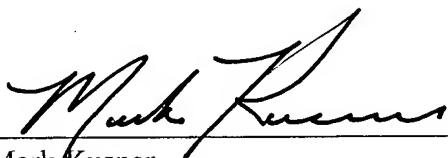
Refractories Co. proposed use of the device to ISG Sparrows Point for use as a bottom in a ladle, the proposed structure was met with skepticism. Only when ISG Sparrows Point was assured by North American Refractories Co. that it (North American Refractories Co.) would assume all responsibility for the resultant test was the device used. It was only after test runs was the component accepted, and ISG Sparrows Point continues to use the proposed structure with success.

It is respectfully submitted that the skepticism shown by consumers as to the feasibility of the proposed structure, together with the fact that Applicants were not aware of the existence of a similar device prior to the present invention shows that the claim structure is not an obvious modification of prior art structures.

For the foregoing reasons, Applicants respectfully request that the Examiner reconsider the prior rejections in view of the attached Affidavits and foregoing comments, and allow the application.

Respectfully submitted,

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I hereby certify that this correspondence (along with any paper referenced as being attached or enclosed) is being deposited on the below date with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to MAIL STOP NON-FEE AMENDMENT, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

Date: February 16, 2004


Christine Goellner